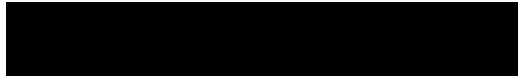


EXHIBIT 16



**UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

TQ DELTA, LLC,

Plaintiff,

v.

**COMMSCOPE HOLDING COMPANY, INC.,
COMMSCOPE INC., ARRIS US HOLDINGS,
INC., ARRIS SOLUTIONS, INC., ARRIS
TECHNOLOGY, INC., and ARRIS
ENTERPRISES, LLC**

Defendants.

CIV. A. NO. 2:21-CV-310-JRG
(Lead Case)

TQ DELTA, LLC,

Plaintiff,

v.

**NOKIA CORP., NOKIA SOLUTIONS AND
NETWORKS OY, and NOKIA OF AMERICA
CORP.,**

Defendants.

CIV. A. NO. 2:21-CV-309-JRG
(Member Case)

**OPENING EXPERT REPORT OF BRUCE MCNAIR ON THE INVALIDITY OF
THE ASSERTED CLAIMS OF THE FAMILY 9 PATENTS**

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disclosed embodiment in the '348 patent. D.I. 169 at 97; *supra* § VIII.B.3.b.(3).

653. For the same reasons discussed above with respect to BI-089, it would have been obvious to a POSA that the control signals conveying the NACK messages of Fukushima (i.e., its retransmission requests) would have a “higher immunity to noise” than the data packets transmitted, and a POSA would have known how to accomplish this. *Supra* § VIII.B.3.a.(2).

654. Additionally, Fukushima gives an example of how to increase the noise resistance of its NACK messages. Fukushima discloses embodiments where its transmitted messages, or “retransmission requests,” are consecutively transmitted multiple times to increase their immunity to noise. Fukushima at 45:22-39 (“[T]he retransmission instruction consecutive output unit **93** performs a consecutive retransmission process for consecutively transmitting the retransmission request by several times... [W]hen many transmission errors occur in the radio section, the number of request transmission times is increased. Thereby, the probability of normal transmission of the retransmission request to the transmitting end increases.”); *see id.* at 45:63-46:6. A POSA would understand that these transmitted messages in Fukushima would have a higher immunity to noise than the received packets in Fukushima.

655. In summary, G.993.1 and Fukushima in view of the general knowledge of a POSA disclose each and every element of claim 10 and render claim 10 obvious as a result.

4. The '809 Patent

a. G.993.1 and BI-089 in view of the knowledge of a POSA

(1) Motivation to Combine

656. For the same reasons discussed above with respect to the '348 patent, a POSA would have been motivated to combine the disclosures of G.993.1 and BI-089 by adding BI-089's proposed ARQ functionality as an option to the G.993.1 standard, and would have expected success in doing so. *Supra* § VIII.B.3.b.(1).

(2) Independent Claim 8(a) “An apparatus comprising:”

657. As I discuss above with respect to the ’348 patent, the combination of G.993.1 and BI-089 discloses an “apparatus,” and renders this limitation obvious to a POSA. *Supra* § VIII.B.3.b.(2)(a).

(b) “a multicarrier transceiver including a processor and memory capable of:”

658. As I discuss above with respect to the ’348 patent, the combination of G.993.1 and BI-089 discloses a “multicarrier transceiver including a processor and memory,” and renders this limitation obvious to a POSA. *Supra* § VIII.B.3.b.(2)(b).

(c) “receiving a packet using forward error correction decoding and deinterleaving,”

659. As I discuss above with respect to the ’348 patent, the combination of G.993.1 and BI-089 discloses multicarrier transceivers that can receive packets using forward error correction decoding and deinterleaving. *Supra* § VIII.B.3.b.(2)(c).

660. The combination of G.993.1 and BI-089 therefore discloses a multicarrier transceiver “capable of receiving a packet using forward error correction decoding and deinterleaving” and renders this limitation obvious to a POSA.

(d) “wherein the packet comprises a header field and a plurality of Reed-Solomon codewords, and”

661. The combination of G.993.1 and BI-089 discloses and/or renders this limitation obvious. Specifically, G.993.1 discloses and/or renders obvious that the packet comprises a header field and a plurality of Reed-Solomon codewords.

662. G.993.1 discloses a PTM-TC for packetized data transport. *See, e.g.*, G.992.1, Annex H. The PTM-TC accepts packets from a PTM entity. *Id.* at § H.1.1. The PTM-TC encapsulates the packet into a special frame, called a PTM-TC frame and maps it into a PTM-TC

frame for transmission over a VDSL link. *Id.* As would be understood by a POSA, the packet received from the PTM entity could include any payload, including, for example, a plurality of Reed-Solomon codewords. *See, e.g.,* G.993.1 § 8.3 (recommending use of “a standard byte-oriented Reed-Solomon code” in PMS-TC sublayer).

663. G.993.1 discloses a PTM-TC frame format for use in both the downstream and upstream directions. G.993.1, § H.4. The frame format includes an information field that “shall be filled with the transported data packet” received from the PTM entity. *Id.* at § H.4.1.1. The PTM-TC frame format includes opening and closing Flag Sequences that identify the start and end of the frame, and “Address and Control octets . . . intended for auxiliary information.” *Id.* A POSA would recognize that the opening flag sequence, the address field, and the control field are a header field.

(e) “wherein the header field comprises a sequence identifier (SID); and”

664. As I discuss above with respect to the ’348 patent, the combination of G.993.1 and BI-089 discloses a “header field compris[ing] a sequence identifier (SID),” and would render this limitation obvious to a POSA. *Supra* § VIII.B.3.b.(2)(e).

(f) “transmitting a message using forward error correction encoding and without using interleaving,”

665. As I discuss above with respect to the ’348 patent, the combination of G.993.1 and BI-089 discloses multicarrier transceivers capable of transmitting messages using forward error correction and without using interleaving. *Supra* § VIII.B.3.b.(1)(f). BI-089 and G.993.1 therefore disclose the limitation of “transmitting a message using forward error correction encoding and without using interleaving,” and render this limitation obvious to a POSA.

(g) “wherein the message is transmitted in a single DMT symbol and”

666. BI-089 and G.993.1 disclose the limitation “wherein the message is transmitted in a single DMT symbol,” and render this limitation obvious to a POSA.

667. As I discuss above with respect to the ’348 patent, BI-089 and G.993.1 disclose transceivers that can transmit messages in a single DMT symbol. *Supra* § VIII.B.3.b.(1)(g). This limitation is therefore obvious.

(h) “wherein the message includes an acknowledgement (ACK) or a negative acknowledgement (NACK) of the received packet.”

668. As I discuss above with respect to the ’348 patent, the combination of G.993.1 and BI-089 discloses a “message include[ing] an acknowledgement (ACK) or a negative acknowledgement (NACK) of the received packet,” and would render this limitation obvious to a POSA. *Supra* § VIII.B.3.b.(2)(h).

669. In summary, the combination of G.993.1 and BI-089 discloses each and every element of claim 8, and renders claim 8 obvious as a result.

(3) Dependent Claim 11

670. Claim 11 further recites:

11. The apparatus of claim 8, wherein a physical layer of the transceiver is capable of generating the packet and the message.

671. The ’809 patent does not explain what it means by “generating the packet and the message.” However, I understand that Plaintiffs have taken the position that the retransmission function of the PMS-TC sub-layer in the ITU-T G.9701 G.fast Standard and/or the “physical layer retransmission method” in the ITU-T G.998.4 G.inp Standard meet the limitation that “a physical layer of the transceiver is capable of generating the packet and the message.” Plaintiffs’ Claim Chart for U.S. Patent No. 10,833,809 (G.9701) at 52-54; Plaintiffs’ Claim Chart for U.S. Patent

No. 10,833,809 (G.998.4) at 57.

672. I take no position in this Report as to whether these functionalities in G.9701 or G.998.4 meet this limitation, and reserve the right to respond to any infringement opinions put forth in Plaintiffs' forthcoming expert reports on infringement. However, to the extent that the identified functionalities in G.9701 or G.998.4 meet this limitation, this limitation would have been obvious to a POSA in view of G.993.1, BI-089, and the general knowledge of a POSA.

673. Like G.9701, G.993.1 contains a PMS-TC layer, where data may undergo forward error correction (FEC) encoding/decoding and interleaving / deinterleaving. *See* G.993.1 §§8-8.4. Both the "packet" and the "message" in independent claim 8 use forward error correction coding, a process which "generates" the final set of bits to be transmitted in the packet and the message (i.e., by adding FEC bits). *See* '809 packet claim 8. In this sense, the PMS-TC layer of G.993.1 is a "physical layer" that "generates" the packet and the message, in the same sense that Plaintiffs seem to use the term for the purpose of their infringement contentions, and therefore renders this limitation obvious.

674. In summary, G.993.1 and BI-089 in view of the general knowledge of a POSA disclose each and every element of claim 11 and render claim 11 obvious as a result.

(4) Dependent Claim 13

675. Claim 13 depends from claim 9, which depends from claim 8. Claims 9 and 13 recite:

9. The apparatus of claim 8, wherein the transmitted message has a higher immunity to noise than the received packet.

13. The apparatus of claim 9, wherein a physical layer of the transceiver is capable of generating the packet and the message.

676. The "higher immunity to noise" limitation would have been obvious over G.993.1 and BI-089 for the same reasons discussed above with respect to the identical limitation in claim

10 of the '348 patent. *Supra* § VIII.B.3.b.(3). The “physical layer” limitation would have been obvious over G.993.1 and BI-089 for the same reasons discussed above with respect to the identical limitation in claim 11 of the '809 patent. *Supra* § VIII.B.4.a.(3).

677. In summary, G.993.1 and BI-089 in view of the general knowledge of a POSA disclose each and every element of claim 13 and render claim 13 obvious as a result.

b. G.993.1 and Fukushima in view of the knowledge of a POSA

(1) Motivation to Combine

678. For the same reasons discussed above with respect to the '348 patent, a POSA would have been motivated to combine the disclosures of G.993.1 and Fukushima, and would have expected success in doing so. *Supra* § VIII.B.3.b.(1).

(2) Independent Claim 8

(a) “An apparatus comprising:”

679. As I discuss above with respect to the '348 patent, the combination of G.993.1 and Fukushima discloses an “apparatus,” and renders this limitation obvious to a POSA. *Supra* § VIII.B.3.b.(2)(a).

(b) “a multicarrier transceiver including a processor and memory capable of:”

680. As I discuss above with respect to the '348 patent, the combination of G.993.1 and Fukushima discloses a “multicarrier transceiver including a processor and memory,” and renders this limitation obvious to a POSA. *Supra* § VIII.B.3.b.(2)(b).

(c) “receiving a packet using forward error correction decoding and deinterleaving,”

681. As I discuss above with respect to the '348 patent, the combination of G.993.1 and Fukushima discloses multicarrier transceivers that can receive packets using forward error correction decoding and deinterleaving. *Supra* § VIII.B.3.b.(2)(c).

682. The combination of G.993.1 and Fukushima therefore discloses a multicarrier transceiver “capable of receiving a packet using forward error correction decoding and deinterleaving” and renders this limitation obvious to a POSA.

(d) “wherein the packet comprises a header field and a plurality of Reed-Solomon codewords, and”

683. The combination of G.993.1 and Fukushima discloses and/or renders this limitation obvious. Specifically, as I discuss above with respect to claim 8 of the ’809 patent in view of G.993.1 and BI-089, G.993.1 discloses and/or renders obvious that the packet comprises a header field and a plurality of Reed-Solomon codewords. *Supra* § VIII.B.4.a.(2)(d).

(e) “wherein the header field comprises a sequence identifier (SID); and”

684. As I discuss above with respect to the ’348 patent, the combination of G.993.1 and Fukushima discloses a “header field compris[ing] a sequence identifier (SID),” and would render this limitation obvious to a POSA. *Supra* § VIII.B.3.b.(2)(e).

(f) “transmitting a message using forward error correction encoding and without using interleaving,”

685. As I discuss above with respect to the ’348 patent, the combination of G.993.1 and Fukushima discloses multicarrier transceivers capable of transmitting messages using forward error correction and without using interleaving. *Supra* § VIII.B.3.b.(2)(f). Fukushima and G.993.1 therefore disclose the limitation of “transmitting a message using forward error correction encoding and without using interleaving,” and render this limitation obvious to a POSA.

(g) “wherein the message is transmitted in a single DMT symbol and”

686. Fukushima and G.993.1 disclose the limitation “wherein the message is transmitted in a single DMT symbol,” and render this limitation obvious to a POSA.

687. As I discuss above with respect to the '348 patent, Fukushima and G.993.1 disclose transceivers that can transmit messages in a single DMT symbol. *Supra* § VIII.B.3.b.(2)(g).

(h) “wherein the message includes an acknowledgement (ACK) or a negative acknowledgement (NACK) of the received packet.”

688. As I discuss above with respect to the '348 patent, the combination of G.993.1 and Fukushima discloses a “message include[ing] an acknowledgement (ACK) or a negative acknowledgement (NACK) of the received packet,” and would render this limitation obvious to a POSA. *Supra* § VIII.B.3.b.(2)(h).

689. In summary, the combination of G.993.1 and Fukushima discloses each and every element of claim 8, and renders claim 8 obvious as a result.

(3) Dependent Claim 11

690. Claim 11 further recites:

11. The apparatus of claim 8, wherein a physical layer of the transceiver is capable of generating the packet and the message.

691. For the same reasons discussed above with respect to the combination of G.993.1 and BI-089, G.993.1 discloses this obvious and renders it obvious. *Supra* § VIII.B.4.a.(3).

692. In summary, G.993.1 and Fukushima in view of the general knowledge of a POSA disclose each and every element of claim 11 and render claim 11 obvious as a result.

(4) Dependent Claim 13

693. Claim 13 depends from claim 9, which depends from claim 8. Claims 9 and 13 recite:

9. The apparatus of claim 8, wherein the transmitted message has a higher immunity to noise than the received packet.

13. The apparatus of claim 9, wherein a physical layer of the transceiver is capable of generating the packet and the message.

694. The “higher immunity to noise” limitation would have been obvious over G.993.1 and Fukushima for the same reasons discussed above with respect to the identical limitation in claim 10 of the ’348 patent. *Supra* § VIII.B.3.b.(3). The “physical layer” limitation would have been obvious over G.993.1 and Fukushima for the same reasons discussed above with respect to the identical limitation in claim 11 of the ’809 patent. *Supra* § VIII.B.4.b.(3).

695. In summary, G.993.1 and Fukushima in view of the general knowledge of a POSA disclose each and every element of claim 13 and render claim 13 obvious as a result.

IX. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

696. I understand that TQ Delta and its experts may present evidence relating to secondary considerations of non-obviousness, for example, while contending that the references described above in my report do not render obvious the Asserted Family 9 Claims. I have reviewed TQ Delta’s Response to CommScope’s Interrogatory No. 17 and TQ Delta’s Response to Nokia’s Interrogatory No. 6, each of which relate to secondary considerations of non-obviousness. None of the “secondary considerations” identified in TQ Delta’s responses to either interrogatory change my conclusion that the Asserted Family 9 Claims would have been obvious, including because TQ Delta has not identified any nexus between any identified secondary consideration and the features of the Asserted Family 9 Claims. Despite TQ Delta’s claims that “the ITU-T has adopted the DSL standards that have incorporated the inventions of many of the Asserted Patents into them,” TQ Delta has not presented any evidence to show a nexus between this statement and the asserted claims of the Family 9 patents.¹⁸ Further, I have seen no evidence

¹⁸ In response to CommScope’s Interrogatory No. 5 and Nokia’s Interrogatory No. 28, TQ Delta asserts generally that “the ’348 and ’809 patents are essential to G.inp and G.fast” and that “the

that the ITU has adopted any standard based on any contribution of Aware or TQ Delta related to any alleged invention of Asserted Family 9 Claims.

697. If TQ Delta should present evidence regarding secondary considerations of non-obviousness in support of the non-obviousness of the Asserted Family 9 Claims, whether in its responsive expert reports, or at a later date, I reserve the right to address this evidence in my reply report, or any supplemental reports thereafter.

X. CONCLUSION

698. In my opinion, based on my review of the Family 9 patents, the materials referenced herein, and my knowledge of what a person of ordinary skill in the art would have known at and before the priority date of the Family 9 patents about the technology at issue, it is my opinion that one of ordinary skill in the art would have understood all of Asserted Family 9 Claims to be invalid for the reasons discussed above.

699. I reserve the right to supplement my opinions in the future to respond to any arguments or positions that TQ Delta or its experts may raise, taking account of new information as it becomes available to me.

'055 patent is essential to the G.fast standard.” These statements do not evidence any essentiality of the individual asserted claims of the Family 9 patents themselves.

Executed in Holmdel, NJ

Date: August 29, 2022



Bruce McNair